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BOOK REVIEWS.

School Algebra. Book I. By GEORGE WENTWORTH and DAVID EUGENE SMITH. Ginn and Company, Boston, 1913. iv + 298 pages. \$0.90.

This is the third of the Wentworth-Smith Series. The authors have prepared a two years course in algebra for high schools, to be issued in two volumes, of which this is the first. The plan of the work is similar to that of their *Academic Algebra*, reviewed in the June number of the MONTHLY, but the treatment of topics is somewhat more extended.

R. R. SHUMWAY.

Les Anaglyphes Géométriques. By H. VUIBERT. Librairie Vuibert, Paris, 1912. 32 pages. Francs 1.50.

Some sixty years ago Wilhelm Rollmann of Stralsund published a paper on the use of two-colored images with glasses of two colors (not necessarily complementary). In 1874, 1875 and 1876 L. Ducos du Hauron of Algiers published several articles on *héliochromie*. The latter investigator imposed one upon the other two stereoscopic views in complementary colors and gave to the picture thus formed the name *anaglyphe*. By looking at this picture with the right eye through a red medium, with the left eye through a green, a marvelous stereoscopic effect is secured, the figure seeming to float in space.

Profiting by the discoveries of Ducos du Hauron, M. Richard exhibited at the international congress of mathematicians in Cambridge last year some forty anaglyphs which were much admired. More recently MM. Richard and Vuibert have published this little book of 32 pages containing thirty specimen anaglyphs illustrative of solid and descriptive geometry, crystallography and physics. Each copy contains a pair of red and green "glasses" mounted in card board. It is the purpose of the authors to issue a series of albums of anaglyphs some of which will be of special interest to teachers in secondary schools.

W. W. BEMAN.

Trigonometry. By ALFRED MONROE KENYON and LOUIS INGOLD. Edited by EARLE RAYMOND HEDRICK. The Macmillan Company, New York, 1913. xi + 132 pages. *Logarithmic and Trigonometric Tables.* Prepared under the direction of EARLE RAYMOND HEDRICK. The Macmillan Company, New York, 1913. xvii + 124 pages. \$1.35.

The Kenyon-Ingold *Trigonometry* is the second of the new series of mathematical books published by The Macmillan Company under the general editorship of Professor E. R. Hedrick, of the University of Missouri. Like the *Davis Calculus*, the first of the new series, it departs somewhat from the traditional course. The first marked departure is that the solution of triangles is attacked immediately and is completely solved in the first three chapters (47 pages), the addition formulas, trigonometric equations and identities, and all references to angles greater than 180° being left out because they are extraneous. The trig-

onometric functions are first defined for acute angles and are used in solving right triangles. Then they are defined for obtuse angles and are used in solving oblique triangles. The student is taught the fundamental principles of solution by means of the *law of sines* and the *law of cosines*. The table of powers and roots at the back of the book makes the latter law practicable for computation. Then he is taught the special logarithmic methods that make use of the *law of tangents* and the *law of tangents of the half-angles*. Geometric proofs are given for these two laws. The proofs usually given are not available because they involve the addition formulas and the formulas for double and half angles which come later in this book.

The first sentence of the preface sounds the keynote of the book. "In trigonometry, as elsewhere, a motive for the study of each topic is necessary to secure the effective attention of the student." The motive so far in the book is the solution of triangles. In most of the current texts, this is made to serve as the only motive. The solution of triangles is begun early and finished late in the course. After the student has learned to solve right triangles, he begins the study of what is called goniometry or trigonometric analysis. He learns about the functions of angles of all sizes, and about the addition formulas and the formulas to which they lead. He knows that the goal toward which he is striving is the solution of oblique triangles; and after he has reached that goal, he wonders why he has had to solve so many equations and prove so many formulas and identities that seem to him unnecessary. The solution of triangles is one of the most interesting problems of elementary mathematics, and it will be more interesting and more satisfactory to the student if it is presented in a straightforward manner with everything extraneous left out, as it is done in this book.

The other parts of trigonometry, which are more important for analytic geometry and the calculus, are taken up in chapters 4, 5, 6, and 7. Directed lines and angles, radian measure, functions of any angle, graphs, the addition formulas, equations and identities, and the inverse functions follow in order. The composition and resolution of forces is made an introduction to the study of angles greater than 180° and is used to illustrate the meaning of the addition formulas. Large angles are used in problems on rotation and angular speed, and the radian is shown to be useful in problems on rotation and mensuration. The applications of large angles include forces, velocities, simple harmonic motion, and vibrations.

So far in the book a motive has been found for each topic. There has been a minimum of abstract trigonometric manipulation. The next chapter deals with identities, equations, and inverse functions. It is unusually complete and well written, especially the part on trigonometric equations. It contains no practical applications.

The authors have used rectangular coordinates from the very beginning of the book. Many teachers believe that plotting with polar coordinates should be a part of every course in trigonometry because it gives the student facility in handling the trigonometric functions, especially those of angles greater than 180° ,

and because it is a good preparation for analytic geometry. The authors have not put this topic in their book. Perhaps they thought it would have to be dragged in without any motive that the student could see.

The last chapter in the book (25 pages) is devoted to Spherical Trigonometry.

The logarithmic and trigonometric tables prepared under the direction of E. R. Hedrick are unusually complete. They are five-place tables and include tables of powers, roots, and reciprocals, and natural logarithms. Brief four-place tables are added for use in problems that do not demand extreme accuracy. The introduction explains the slide rule and gives a graphic representation of interpolation.

Answers to problems are not given.

W. H. BUSSEY.

NOTES AND NEWS.

The August number of *The Popular Science Monthly* contains an article entitled "Bernoulli's Principle and its application to explain the curving of a base ball."

Mr. E. J. Moulton has been promoted to an assistant professorship in mathematics at Northwestern University. He has just taken the doctor's degree at the summer convocation at the University of Chicago.

John Wiley and Sons have recently published "The Theory of Relativity," by Professor Robert D. Carmichael, of the University of Indiana, as No. 12 of the series of mathematical monographs edited by Mansfield Merriman and Robert S. Woodward. The price is \$1.00.

Mr. H. R. Kingston, graduate student at the University of Chicago, has been appointed to an instructorship in mathematics at the University of Manitoba, Winnipeg, Canada.

The Macmillan Company has published an *edition de luxe* of "The Davis Calculus," printed on India paper and bound in flexible leather. The thickness of the book is one half that of the regular edition. The price is \$2.40. The price of the regular edition is \$2.00.

DR. W. KILLING has for the second time been awarded the Lobachevski prize of the Physico-Mathematical Society of Kasan.

Miss Martha McDonald, graduate student at the University of Chicago, is to be in charge of the department of mathematics at Oxford College for Women, Oxford, Ohio.

"Tables of the Exponential Function" computed to twenty places, compiled by C. E. VAN ORSTAND, were published in the June number of the *Journal of the Washington Academy of Sciences*.

At the University of Chicago H. E. SLAUGHT and G. A. BLISS have been promoted to full professorships in mathematics.